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Novel Insights from Clinical Practice

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Two Cases of Paradoxical Nonscarring Alopecia after Mesotherapy with Dutasteride

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Established Facts

- Mesotherapy is a minimally invasive procedure used for medical or cosmetic purposes that involves the injection of active substances into the dermis and subcutaneous tissue. Although the Federal Drug Administration (FDA) has not approved mesotherapy with dutasteride for the treatment of androgenetic alopecia, the efficacy and safety of this technique have been reported by distinct groups and it is increasingly in demand by patients.
- Injection-site infections, granulomatous foreign body reactions, and fat necrosis among others are well-known adverse events derived from the technique. The development of paradoxical alopecia as a side effect is extremely rare, and it has been speculated that such complications may be a result of a hypersensitivity reaction to the components of the injectable solution. The lack of product regulation together with the performance of the procedure by nonmedical staff makes it difficult to keep proper records of side effects.

Novel Insights

- We present 2 cases of paradoxical nonscarring alopecia after mesotherapy with dutasteride. In both cases, ethanol was used as a solvent in dutasteride containing solution. Based on the available data on ethanol toxicity, we hypothesize that this agent could induce cell damage and death in the hair follicle with subsequent hair loss. We propose dimethyl sulfoxide, classified by the FDA in the safest solvent category, as a possible secure alternative.
- Paradoxical alopecia after mesotherapy with dutasteride should not be underestimated, and it emphasizes the need to standardize the technique and the importance of the professional experience in order to better understand the benefits and the risks of this procedure overall.

Keywords
Alopecia · Dutasteride · Mesotherapy

Abstract
Alopecia after mesotherapy with dutasteride is an extremely rare complication. Dutasteride is a second-generation 5a-reductase enzyme inhibitor that decreases serum dihydrotestosterone levels by 90%. It inhibits both type 1 and 2 enzymes, whereas finasteride inhibits only type 2. Mesotherapy with dutasteride is a novel treatment for hair fall which involves microinjection of the drug into the dermis with negligible systemic absorption. Frequent mild transitory side effects in the site of injection are described in medical litera-

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ture, but few cases of secondary alopecia have been reported. This stands out given that mesotherapy is becoming such an increasingly common procedure with a great number of patients treated with this technique. We present 2 cases of patchy alopecia after mesotherapy with dutasteride in a male and a female with androgenetic alopecia. One of them developed skin atrophy on the affected areas without improvement at short term follow-up. These cases highlight the possible paradoxical side effects of mesotherapy as a therapeutic technique for hair loss.

Introduction

Mesotherapy is a new method of administration of antiandrogens for the treatment of androgenetic alopecia (AGA) that has gained popularity over the last years [1]. However, there are no controlled published studies about its efficacy and safety in hair diseases. Moreover, standardization of the procedure is necessary. Herein, we present 2 cases of patchy alopecia after intradermal injection of dutasteride and underline the importance of not underestimating this potential side effect.

Case Report

1st Case

A 42-year-old woman with antiphospholipid syndrome requiring acetylsalicylic acid was diagnosed with androgenetic alopecia. Treatment with oral minoxidil (1 mg/day) was started, and she received 1 session of mesotherapy with dutasteride containing solution. The commercial preparation used was a 10-mL vial of dutasteride 0.05%, admixed with 4 mL of ethanol and 5,995 mL of propylene glycol. After disinfection, intradermal injections of dutasteride 0.025%, prepared by diluting the original solution with mepivacaine 2%, were done. The total volume injected was 3 mL by leaving 0.01–0.05 mL of the solution at a 1-cm interval using a 30-gauge needle. During the procedure, she complained about tolerable pain. One month later, she developed focal patchy alopecia at mesotherapy injection site without atrophy, erythema, scaling, or local discomfort (Fig. 1). Dermoscopy revealed multiple white dots, yellow dots, several vellus hair strands, and decreased follicular openings. The patient did not return, and follow-up was lost.

2nd Case

The second case was a 58-year-old man diagnosed with androgenetic alopecia for which he was prescribed dutasteride 0.5 mg and minoxidil 2.5 mg administrated once daily. Furthermore, he underwent a total of 2 sessions of mesotherapy with the same technique as in the first case, after which he developed several bald atrophic patches at mesotherapy injection sites (Fig. 2). Five percentage topical minoxidil was added to the treatment, and after 3 months of follow-up, no improvement has been observed.

Discussion

Diverse complications associated with mesotherapy for medical and cosmetic purposes have been reported in the literature so far. Plachouri and Georgiou [1] summarized all the mesotherapy-related complications published between 1992 and 2018 [2]. These include injection-site infections, granulomatous foreign body reactions, fat necrosis, lichenoid drug eruptions, and Nicolau syndrome. Regarding mesotherapy with dutasteride, the most frequent adverse events are pain at injection sites that subsides shortly after session, headache, and itching [3, 4]. Less than 10 cases of alopecia after mesotherapy have been reported as far as we are concerned [5–8]. From

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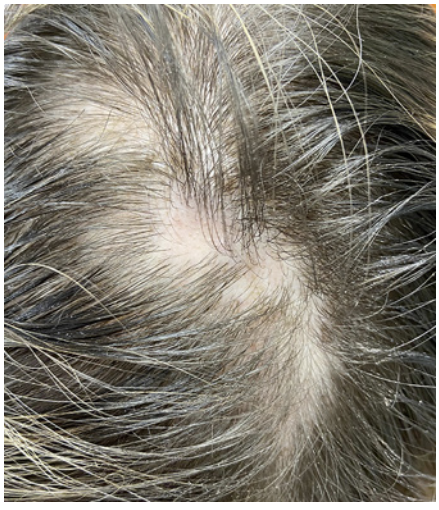

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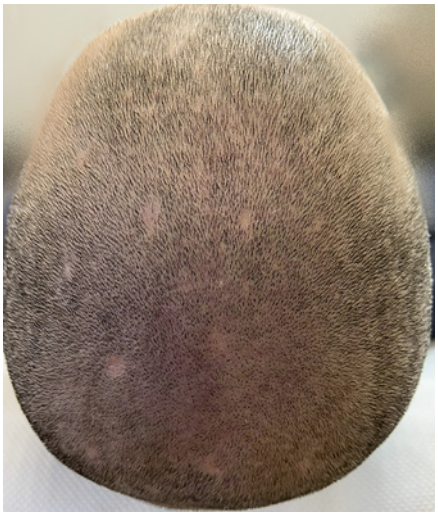

Fig. 1. Frontal and parietal alopecia plaque at mesotherapy injection site.
Fig. 2. Multiple atrophic patches of alopecia at mesotherapy injection sites.

those, 2 correspond to microinjections of dutasteride. In both cases, dutasteride 0.005%, among other medications, was administered in 2 women who suffered from patchy alopecia after multiple treatment sessions with variable improvement over time. It has been speculated that such complication may be a result of a delayed cutaneous reaction to mesotherapy or an acute reaction to manufacturing changes in composition of the injected solution [7]. Dutasteride is a hydrophobic drug which needs to be dissolved in either ethanol or dimethyl sulfoxide (DMSO) [9]. Ethanol induces cell apoptosis accompanied by reactive oxygen species overproduction, autophagy activation, and an increased nuclear translocation of nuclear factor kappa B [10] Indeed, given the established role of ethanol in inducing cell death, it is currently under study as a promising agent for promoting tumor cell death in prostate cancer [11] and hepatocellular carcinoma [12] Based on our cases, we hypothesize that the toxicity derived from the ethanol used in the formulation could have played a role in hair follicle damage. On the other hand, DMSO is an organic polar aprotic molecule with an amphipathic nature that is ideal for dissolving poorly soluble polar and nonpolar molecules. Though clinical trials for medical applications of DMSO reported toxicity in the 1960s, later, the FDA classified this molecule in the safest solvent category [13]. Therefore, DMSO could be a safe alternative for the formulation of dutasteride solution, although systematic studies are needed in order to standardize the technique and the appropriate components so as to minimize the risk of potential adverse reactions.

Statement of Ethics

Written informed consent was obtained from the patients for publication of this case report and any accompanying images.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

Leandra Reguero del Cura: literature review, acquisition of data, and writing. Adrian De Quintana Sancho: design, revising the article. Marta Rubio Lombraña: literature review and revising the article. Ana Elisabet López Sundh: literature review. Marcos Antonio González López: conception and design and revising the article.

Data Availability Statement

The data that support the findings of this study are openly available in PubMed at https://pubmed.ncbi.nlm.nih.gov.

References

1 Plachouri KM, Georgiou S. Mesotherapy: safety profile and management of complications. J Cosmet Dermatol. 2019;18(6):1601–5.
2 Moftah N, Moftah N, Abd-Elaziz G, Ahmed N, Hamed Y, Ghannam B, et al. Mesotherapy using dutasteride-containing preparation in treatment of female pattern hair loss: photographic, morphometric and ultrastructural evaluation. J Eur Acad Dermatol Venereol. 2013;27(6):686–93.
3 Abdallah MA, El-Zawahry KA, Besar H. Mesotherapy using dutasteride-containing solution in male pattern hair loss: a controlled pilot study. J Pan Arab Leag Dermatol. 2009;20:137–45.
4 Schmutz JL, Barbaud A, Trechot P. [Alopecia and mesotherapy]. Ann Dermatol Venereol. 2010;137(4):338.
5 Duque-Estrada B, Vincenzi C, Misciali C, Tosti A. Alopecia secondary to mesotherapy. J Am Acad Dermatol. 2009;61(4):707–9.
6 El-Komy M, Hassan A, Tawdy A, Solimon M, Hady MA. Hair loss at injection sites of mesotherapy for alopecia. J Cosmet Dermatol. 2017;16(4):e28–30.
7 Kadry R, Hamadah I, Al-Issa A, Field L, Alrabiah F. Multifocal scalp abscess with subcutaneous fat necrosis and scarring alopecia as a complication of scalp mesotherapy. J Drugs Dermatol. 2008;7(1):72–3.
8 Selleckchem [Internet]. Dutasteride 5-alpha Reductase inhibitor. [cited 2020 Sep 12]. Available from: https://www.selleckchem.com/products/Dutasteride.html.
9 Maiuolo J, Maretta A, Gliozzi M, Musolino V, Carresi C, Bosco F, et al. Ethanol-induced cardiomyocyte toxicity implicit autophagy and NFkB transcription factor. Pharmacol Res. 2018;133:141–50.
10 Maiuolo J, Maretta A, Gliozzi M, Musolino V, Carresi C, Bosco F, et al. Ethanol-induced cardiomyocyte toxicity implicit autophagy and NFkB transcription factor. Pharmacol Res. 2018;133:141–50.
11 Plante MK, Arscott WT, Folsom JB, Tighe SW, Dempsey RJ, Wesley UV. Ethanol promotes cytotoxic effects of tumor necrosis factor-related apoptosis-inducing ligand through induction of reactive oxygen species in prostate cancer cells. Prostate Cancer Prostatic Dis. 2013;16:16–22.
12 Meng ZW, Cai XR, Lin CZ, Chen YL, Liu S. The Islanding effect: a special method of percutaneous peritumor ethanol injection for hepatocellular carcinoma: 15-year follow-up outcome. Medicine. 2021 Jan 22;100(3):e24365.
13 Verheijen M, Lienhard M, Schrooders Y, Clayton O, Nudischer R, Boerno S, et al. DMSO induces drastic changes in human cellular processes and epigenetic landscape in vitro. Sci Rep. 2019;9:4641.